

DOCUMENT RESUME

ED 311 945

JC 890 444

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TITLE Computer Use in Two-Year College Systems.
PUB DATE 87
NOTE 15p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Faculty; Community Colleges; *Computer Assisted Instruction; *Computer Literacy; *Computer Science Education; Faculty Development; Laboratories; *Microcomputers; State Surveys; Teacher Attitudes; Teacher Participation; Two Year Colleges

ABSTRACT

In 1989, a survey was conducted to assess the status of computer use and education in two-year colleges in Alabama. Three copies of the survey instrument were sent to the academic deans of all 41 institutions in the state's two-year college system. The deans were asked to complete one questionnaire and ask two randomly selected teachers to complete the others. Responses were received from 30 teachers, 16 department heads, and 24 administrators. Study findings included the following: (1) Alabama ranked below the national average in the number of computers used; (2) most computers were purchased with grant funds; (3) though 50% of the schools used Apple or IBM-PC microcomputers, the remaining schools used a hodgepodge of machines, limiting compatibility and software sharing; (4) Apple users had an average of 47 programs for their machines as opposed to 40 for the IBM-PC users; (5) responding junior colleges tended to place their microcomputers in a centralized laboratory, while the technical colleges tended to place their computers in occupational facilities; (6) of those using the computer in instruction, 70% used word processors, spread sheets, and database managers; 50% taught programming skills; and 25% used them in areas other than business; and (7) teachers were generally not involved in developing computer programs and not consulted about purchases. The report also presents findings from other relevant research and offers recommendations for improving the use of computers in Alabama's two-year colleges. (VVC)

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Computer Use in Two-Year College Systems

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1987

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Computers in Two-Year College Systems

The computer is considered by the general public to be heir to a long line of electronic gadgetry, servant of the mathematician, and purveyor of aggressive games. Students perceive computer usage as "play," but in reality computer education has been identified as one of the five new basics. There can be no doubt about the computer's labor- and time-saving ability. The question is how can popular perception be altered.

Computer use will expand to support all kinds of jobs, and understanding their use will be necessary to future job seekers. What are the implications for teachers in the two-year college system? What is the status of computer education in the two-year college curriculum?

Rampy (1983) identified four areas that help focus on use of computers in schooling:

1. Who gets computers? Should there be a state plan to determine allocation? Should each college be free to go its own way? Should computers be equally distributed to the colleges?
2. Who uses computers? Do teachers and administrators use computers? Are students required to use computers to accomplish assignments?
3. How are computers used in the school? Where are computers housed? Is programming or Computer Assisted Instruction (CAI) used? Is instruction offered in the content area?
4. How are computers perceived by students, instructors, administrators, and community?

In general, Rampy's assessment was followed. Exception was taken to the first question; the answer is moot. The answer to the first

question (Who gets them?) will be the same as the second (Who uses them?).

In addition, teachers were asked what kind of equipment they use.

Two-year colleges in Alabama include junior colleges, technical colleges, and one senior level college. Answers to the following questions were sought in surveying these schools:

1. Who uses computers in the two-year college system?
2. What kind of computers are used in the system? (The intent was to query only those using stand-alone microcomputers, but some respondents included networked and minicomputers.)
3. What is the computer used for--record keeping, instructional media, testing, or developing new materials?
4. What problems need to be addressed to enhance computer use?

A survey document was prepared to inquire about computer usage in these schools. Three copies of the survey were sent to the academic dean of each two-year college. A cover letter instructed the deans to complete one survey form and to ask two randomly selected teachers to complete the others. A follow-up survey was distributed at a two-year college conference in Mobile, Alabama (April 2-4, 1986). All 41 colleges in the two-year system in Alabama were surveyed. Responses were received from 30 teachers, 16 department heads, and 24 administrators. This represented a 58% response rate.

Who Uses 'em?

Of the 46 respondents who were teaching, 56% held master's degrees or higher, 34% held bachelor's degrees, and 8% held associate or lower credentials. Seventy-eight percent of the teachers had 15 years or less

service. Thirty-two percent of the teachers indicated they taught math, computer applications, or science and 28% taught business education.

Lockheed and Frakt (1984) stated that teachers should demonstrate the value of the computer in cost and time-saving. Teachers should set a positive example of computer use in their daily work; yet, teachers resist change. Bowden (1982) stressed that teachers perceive computers as a threat to their traditional roles. In the Alabama system, the number of computers is lower than the national average.

"The Beast Itself"

"Microcomputer" is a generic name for a small, self-contained computer system. Micros have a central processor unit, a video display, memory, and an input device (usually a keyboard and a disk drive or cassette tape).

Most computers were purchased with grant funds without guidance. The result is a patchwork of brands, power, and compatibility. Cardenas (1983) stated that this approach has caused the computer to come in the back door of the school house. The computer is the most innovative system to come into education in many years and should be part of the budget process. Compatible equipment would allow sharing of software.

The survey demonstrated that this is exactly the situation in Alabama two-year colleges. Two major groups of microcomputers are used by 50% of the system; the remainder is a hodge-podge of machines. Perhaps the greatest surprise of the survey was in the brand of computers used in the schools. Seventeen of the teachers use an IBM-PC as compared to 6 who use the Apple II group.

The Apple users had an average of 47 programs for their machine as opposed to 40 for the IBM-PC. This might suggest that the IBM machines have more recently arrived on campus.

All teachers reported that their computer would support BASIC computer language, but many also cited PASCAL and COBOL. Computer application teachers used a variety of other languages, often including FORTRAN and RPB II. Almost all the teachers reported using disk drives and printers. Many also reported use of a modem--a device that allows microcomputers to "talk" over telephone lines. Only one teacher reported the use of a hard disk.

How the Machines Are Used

There are two main considerations in the use of microcomputers in the two-year college system: (a) the location for housing the computers and (b) the type of programming used.

Beving (1984) stated that when a limited number of computer stations are available in the school, the computers should be housed in the media center in the library. The reasons are: (a) By locating the computers in the existing media center, there is no need to hire additional staff; (b) the computer users will be monitored without teacher intervention allowing the teacher to work with other students or to assign remedial computer work outside of class; and (c) the central location increases the number of students and teachers using the computer.

Junior colleges tend to place their microcomputers in a centralized laboratory. The lab is accessible to others when computer classes are not scheduled and is usually staffed by a lab assistant. Teachers can

assign a program from a multi-media package to the class with the assurance that the assistant will help the student run the program.

Technical colleges tend to place the computer in the occupational area. An inherent problem with this arrangement is that the lab is typically used five or six hours a day and it is very difficult to schedule use by other departments.

The use of a central lab is economical and allows more students to use the computers. However, location of computers in a central lab eliminates the teacher's supervision of students. The centralized lab may be an advantage in time utilization, but it removes the teacher from the teaching process. Students may feel that the computer is not very important because it is not in the teacher's room or office and may assume that the teacher is unfamiliar with the machine or the software.

In one classroom the use of a computer has increased as students became familiar with the machine. Students are allowed to "play" educational games after completing their assignments and the computer is always available to them. They are reluctant to visit the math lab to use the computer housed there.

Several problems must be addressed before educational promise of the computer will be fulfilled. Discrepancies exist on the basis of race and sex in that computer education is not reaching minority populations. Lockheed and Frakt (1984) suggested that the computer lab is becoming a "white boys' turf" where girls and other minorities are reluctant to enter. Solutions to correct the problem are shaky at best and rely on "quick-fix" or "pie-in-the-sky" reasoning.

Lockheed and Frakt (1984) found that computer games and software were directed to a male market. Rampy (1983) stated that boys have a clear idea of what they want to do with the computer and, therefore, are more aggressive in seeking time on the computer. However, it seems clear that computers for women are viewed as an extension of the traditional work of secretaries and clerks. Rampy (1983) reported that most girls in computer classes are interested in business programs. This survey confirmed that the two-year schools teach business applications more often than any other content area.

Anderson, Welch and Harris (1984) found that unequal access to computers is a consequence of social and economic status. Rampy (1983) pointed out that economically depressed parents are unlikely to buy computers.

Microcomputers can enhance the educational environment in three ways: (a) Learning about computers, (b) learning with a computer (CAI, etc.), and (c) learning to use the computer as a tool for modern times.

There is little learning about computers in the two-year college system. This is particularly troubling because there are so few computers in the secondary systems in the South (Anderson, 1984). Only 12% of southern 13-year-olds have had in-school computer experience as compared to 25% in the West. In quoting a Johns Hopkins study (CSOS, 1983), Rampy stated that only 29% of all secondary schools in the South had one or more computers.

Of those using the computer as instructional media, 70% use word processors, spread sheets and data base managers; 50% teach programming

skills, and 25% are used for areas other than business. There is ample evidence that the computer is used as a teaching tool in the instructional area (80% teach business and content area). Computers are used by 80% of the instructors to keep records, and all use computers to create instructional materials. These teachers use this new tool to save time.

A study by Miller (1985) indicated that the basic "user friendliness" of CAI, coupled with the ability of the student to set the pace, would be an advantage in individualized instruction classrooms. Abbott (1983) suggested that computer exercise is of little value if the concepts are not first mastered. Ascher (1984) did find that CAI was effective with learning-disabled students, but attrition rate was much higher for the CAI group than for the control group.

Computer Assisted Instruction (CAI) has acquired a bad name in the literature because of its rather structured format. One problem with CAI is a lack of teacher involvement in the development of programs. It could be argued that the educational community has abdicated the lead in computer instruction to the producers of home computer educational packages. Teachers are often encouraged to buy packaged programs rather than to develop a program themselves (Beving, 1984). Unfortunately, "canned" programs rarely fit a syllabus, and the educational quality of the programs is often poor. Home programs are too noisy for class use and the visual or musical "reward" for the correct answer is too long. The flashing lights and catchy music that seem to entertain the child so well in the computer store becomes a chaotic cauldron of stupidity after the tenth rendition.

Alvarado (1984) estimated that by the end of the 1984 academic year there were 450,000 computers in U.S. schools while 40 to 50 million American homes had computers. Komoski (1984) reported that ten times as much money was being spent on educational software for the home market as for the public school market. Schools are lagging behind and surrendering control over the content of educational programming to the home market.

Teachers should be writing their own programs. Programs with complex graphics and sound are no better at education than text programs (Smith, 1985). Miller (1985) stated that simple programs which are well-targeted serve the educational needs of students better than complex programs. The programs must be challenging without being intimidating. Miller also pointed out that many things are not well-suited to CAI and would be better handled in another format. Often, CAI becomes an electronic flash card.

Summary

After analyzing data from this survey, the following conclusions can be drawn and recommendations made for the two-year college system:

1. Teachers are not involved in computer education and are not consulted about computer purchases. Professional program writers prepare the software and a librarian or lab assistant assists students in running the programs. Teachers must become involved with computer education if it is to be beneficial to students. A need for better housing of computers is evident. Each school needs a small central lab, but most computers should

be housed in the content areas.

2. A systematic plan for computer purchases in the two-year college system should be developed; more uniformity would allow for the sharing of programs.
3. Teachers need more preparation time to bring the new technology "on-line." As previously stated, the South lags behind the rest of the country in the use of computers in schools. Two-year system teachers often give students their first hands-on experience with computers. Syllabi were changed by 79% of the teachers to accommodate computer technology.
4. The goal should be to identify "high tech instructors" rather than "high tech programs" in the two-year college system. Imposing high technology instruction on teachers who are unwilling or unprepared to handle high technology is a waste of the State's money. Increasingly, there are no programs of study that are not "high tech."
5. In-service training needs to be developed to enhance teachers' confidence with computer technology. Teachers must learn to use the new technology or the computer will be found on the closet shelf with the educational TV set. All instructors should be taught BASIC computer programming skills.
6. The value of readily available "canned" software is suspect and must be reviewed and evaluated for content and appropriateness; however, software producers are unwilling to provide copies for approval. Frequently, teachers must evaluate the appropriateness of software programs with only a one-paragraph abstract

in a catalog and a cartoon of what the programmer wanted the graphics to look like.

7. Each school should require a computer awareness program for all students. This class should not be confused with computer science; it should stress practical considerations such as how to turn on the machine, keyboard awareness, how to "boot" a disk, and what computers can do in real terms.

Gappert (1980) indicated his belief that the post-industrial era will be based on information handling; however, studies confirm that even these "high tech" jobs will not necessarily require four years of formal education. All students should have an opportunity to be trained for these jobs and the two-year college system is in the best position to provide training of future workers for these jobs.

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